

# ASSIGNMENT 4: DATA VIZ FOR ADVOCACY

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CS-GY 6313 B

## 1 Interactive Visualization

### 1.1 Question

#### How are men's mental states in the US?

The question is a bit general, but I want to communicate to a general audience that is not aware of the high levels of mental health issues that men face in the US.

Additionally, I did not want to have it in bright bold, but I want to communicate suicide statistics to highlight the mental health problems of men.

### 1.2 Data

#### 1.2.1 Data Source

There are a few data sources to get information from.

The CDC holds lots of information, but particularly I looked into:

1. Behavioral Risk Factor Surveillance System (BRFSS) Survey
2. Household Pulse Survey
3. National Health and Nutrition Examination Survey (NHANES)
4. National Health Interview Survey (NHIS)

However, much to my dismay, lots of the data I was looking for was not available. I was able to retrieve information for suicide rates, but the data regarding mental health for men was quite limited or obscure.

I ended up using [https://www.cdc.gov/suicide/facts/data.html#cdc\\_data\\_surveillance\\_section\\_4-suicide-rates](https://www.cdc.gov/suicide/facts/data.html#cdc_data_surveillance_section_4-suicide-rates) for suicide rate information, and <https://www.apa.org/monitor/2015/12/numbers> for general information and stats regarding suicide rates.

#### 1.2.2 Serving Information

For serving information, we use D3's csv function:

```
import * as d3 from "d3";
import { Dataset } from "@types/types";
import theme from "@types/themes";

export async function loadRatesData(): Promise<Dataset[]> {
  const data = await d3.csv("/rates.csv", d3.autoType);
  console.log(data);

  return [
    {
      label: "Total_Population",
      data: data.map((d: any) => ({ x: d["Year"],
        y: d["Total_Population"] })),
      color: "#d4c2d4",
    },
  ],
}
```

```

    label: "Male",
    data: data.map((d: any) => ({ x: d["Year"], y: d["Male"] })),
    color: "#cbd4c2",
  },
  {
    label: "Female",
    data: data.map((d: any) => ({ x: d["Year"], y: d["Female"] })),
    color: "#c2c2d4",
  },
];
}

```

and pass the data to the chart component through a wrapper.

## 1.3 Visualization

### 1.3.1 Frontend Setup

The frontend is a simple NextJS application that uses the D3 library to create the chart, and react hooks to update and keep track of state.

My main secondary goal for this visualization was to make the design look sleek and simple.

As opposed to my previous visualization, I wanted to make a website that was more visually appealing and easier to understand, as well as having goodies like smooth transitions and a responsive design.

For smooth transitions I used the Lenis library, which allowed for smooth scrolling. This greatly improved the feel of the website, and allowed me to dynamically render the chart when the user scrolls to the chart section.

```

const [isVisible, setIsVisible] = useState(false);
const ref = useRef<HTMLDivElement>(null);

// Lenis hook to listen for scroll events
useLenis(() => {
  if (ref.current && !isVisible) {
    const { top, bottom } = ref.current.getBoundingClientRect();
    const windowHeight = window.innerHeight;

    if (top + 300 < windowHeight && bottom > 0) {
      setIsVisible(true);
    }
  }
});

```

To further my secondary goal, I carefully created a color scheme that was easy on the eyes, sleek, and modern. Also, I utilized DaisyUI to create components with a modern look and the color scheme described above:

```

daisyui: {
  themes: [
    {
      mytheme: {
        primary: "#50514F",
        secondary: "#CBD4C2",
        accent: "#CF8E80",
        neutral: "#540D6E",
        "base-100": "#FFFCFF", // Background
        info: "#CBD4C2",

```

```

      success: "#CF8E80",
      warning: "#FFFCFF",
      error: "#540D6E",
    },
  },
],
}

```

### 1.3.2 Additional Components

The main page has a Hero component, a CTA, and data callouts.

The Hero displays the main question.

The CTA displays a button that takes the user to <https://www.mensmindsmatter.org/> to learn more about the topic and how to get involved with donating.

**The final components are the data callouts**, which display some key insights about men's health. I wish this could have been charts instead, but finding specific information about mental health was a bit difficult. Nevertheless, these prove helpful to the user to get informed on the topic.

### 1.3.3 Visualization Logic

I revisited D3 to create a custom chart, building upon my previous experience with the library.

Working directly with D3 again proved to be more challenging but also rewarding, as it deepened my understanding of chart components and their implementation.

I gained a more explicit appreciation for the building blocks of a chart:

- Margins: Carefully planned margins to ensure sufficient space for elements like axes, labels, and legends.
- Scales: Mapped dynamically to the data, ensuring that the chart is responsive to changes in data.
- Line: This time, I used 3 lines to represent the data, each with a different color.
- Tooltip: On hover, the user can see the exact data point they are looking at.
- Circles: Since we were using 3 lines and transitions, the circles also follow the lines created.
- Dynamics: I progressively drew the lines, and added a transition to make the chart more visually appealing. I also believe that this draws attention to the chart, as the user is more likely to notice the chart if it is moving. Plus it highlights how rates increase over time.
- Axes: Created axes and basic labels for intuitive and fast understanding by the user.

## 1.4 Improvements

### 1.4.1 More Charts

I would have liked to have more charts, but I was unable to acquire relevant data.

In the future, I would like to have a chart that shows the rates of mental health issues posed by men. This would be a more direct visualization of the trends, and how it's becoming a bigger and bigger issue.

### 1.4.2 Interactivity

There are only two ways to interact with the chart.

One is to make it render by scrolling, and the other to hover over the lines to see the data points.

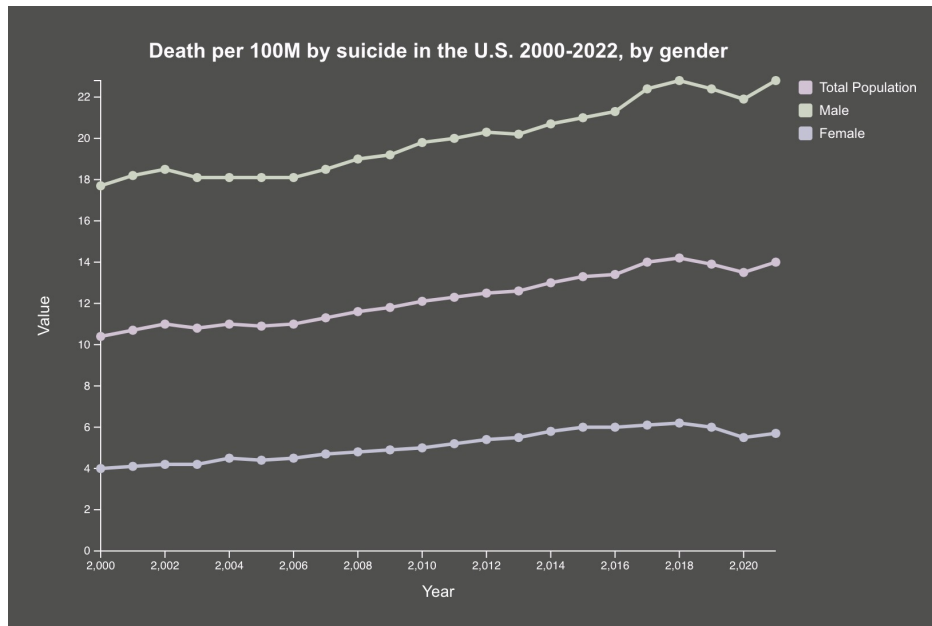


Figure 1: Screenshot of the final visualization.

In the future, with more Data, I would've liked to leverage the power of D3 to create more interactive elements, like a dropdown to select different data sources, or a zooming tool to focus on a particular aspect of the chart.

## 1.5 Conclusion: Do we answer the question?

I believe we accomplish the mission of shedding light on the topic of men's mental health in the US.

I believe the strong suit of my assignment is the design of the page and the manner in which things are presented to the user.

The smooth scrolling works great, and the color scheme allows for the visualization to look as part of the page rather than just pasted in.

The animation of the lines was also a nice trick that I believe conveys the message of growth in mental health issues over time.

However, I would have liked to have more data to show the trends in mental health issues, as well as more information on feelings to create an even more compelling narrative.

## 2 Extra Credit

We are looking at: "The affordable housing crisis, explained" by Patrick Sisson, Jeff Andrews, and Alex Bazeley

I believe that this is a good article, as it helps educate the reader on the current state of housing in the US, and what the factors are that are contributing to the crisis.

Everyone knows that houses are expensive, most American readers will know that there is a problem with housing, but not everyone will know the specifics of the problem. It's rare to know exactly why these problems are happening, and what can be done to fix them.

### The visualization's narrative structure and persuasive techniques:

The narrative is linear, and addresses problems one by one.

It starts by giving an overall "state of the union" of housing in the US, and cites plenty of sources. It touches on the overall points, like rebounding from the recession in 08, widening inequality, and housing costs rising faster than wages.

The persuasion is done a bit through empathetic means, but most of the time it's through data and policy.

#### **How visual elements support the intended message:**

Some visuals support the message greatly, by showing trends in a concise way.

For example, the "cost of construction materials" chart is great, because, you don't really care about the actual cost, but, if you see that the trend is going up (especially through a chart that shows a clear line), you will quickly draw a conclusion as to what the subsection is talking about.

However, the visual "Federal expenditures on housing programs" is a bit misplaced in my opinion. It's a bar chart that shows a few levels of housing related expenditures, but there is no trend.

The main point being drawn is that the US favours mortgage holders over renters, but I believe that this did not need a bar chart, or at least, it could have used a line chart to show how the trend has become more in favour of mortgage holders over time.

#### **The effectiveness of the call to action:**

Since it's an explainer, there is no call to action. However, in a way, the call to action is implicit. You would not tell the reader who to vote for specifically, but by showing them the issues, they are now better informed and might vote for a candidate that has a plan to fix the housing crisis.